

DOCUMENT RESUME

ED 271 932

EC 190 241

TITLE Assistive Devices in Public Schools Which Aid the Understanding of Verbal Language: A Guide for Facility Planning. Facility Guidelines.

INSTITUTION Maryland State Dept. of Education, Baltimore. Office of School Facilities.

PUB DATE Mar 86

NOTE 26p.

PUB TYPE Guides - Non-Classroom Use (055)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS *Audiology; Captions; *Communication Aids (for Disabled); *Deafness; Educational Facilities Planning; Elementary Secondary Education; Equipment; Facility Guidelines; *Hearing Impairments; *Public Schools; *Sensory Aids

IDENTIFIERS Maryland

ABSTRACT

The guide is intended to help in planning facilities for students with hearing impairments by acquainting the reader with assistive devices that help in the understanding of verbal language. An initial section reviews the prevalence of individuals with hearing impairments in Maryland. Assistive devices are then described, including induction loop systems, FM radio frequency systems, infrared systems, telephone aids, hardwire, and captioning (closed and real-time types). Guidelines offer information on the location of the devices for their most effective use. Considerations for large groups, small/medium groups, and one-to-one settings are noted. A chart depicts information for help in device selection. Factors such as equipment, relationship to current public address systems, signal strength, upkeep/care, cost, and major advantages and disadvantages are listed for each of the six types of devices. The manual concludes with a reference list of installations in the Maryland area. (CL)

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Facility Guidelines

Office of School Facilities

Maryland State Department of Education

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ASSISTIVE DEVICES IN PUBLIC SCHOOLS WHICH AID THE UNDERSTANDING OF VERBAL LANGUAGE

A Guide For Facility Planning

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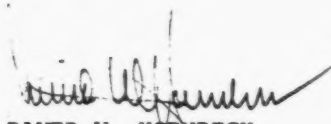
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FOREWARD

This guide is designed to help Maryland's educators, facility planners, administrators, architects, and citizens to become familiar with assistive devices which aid in the understanding of verbal language. This publication offers information to be used during the facility planning process in an effort to maximize the ease of communication by hearing impaired users of our public school buildings.

This guide provides descriptive information about the various devices, along with guidelines for their location in public schools and administrative buildings. Information in this publication allows for the placement of assistive devices within the context of any school system.

Facility planning and design are of paramount importance in meeting the goal of providing equal opportunity for all students and employees. Thoughtful planning also can increase the participation of parents and the general public in the use of our public school buildings.



DAVID W. HORNBECK
State Superintendent of Schools

INTRODUCTION

The following facility planning guide was prepared to assist in the selection of assistive devices to be used by hearing impaired children and adults in public school buildings. Although assistive devices for individuals with impaired hearing include all systems designed to improve communication, these guidelines focus only on those devices which aid the understanding of verbal language. Included are those systems which allow better understanding of speech through audition, vision, or both.

The population to be served includes both hearing impaired and deaf individuals. There are more than 17 million children and adults with impaired hearing in the United States; approximately 2 million people are deaf and 15 million people are hard of hearing. A large number of these persons use the public schools, including students, local Board of Education employees, families of students, and members of the community at large. Consequently, it is incumbent upon us to facilitate communication for these individuals in instructional and meeting rooms of all sizes.

The use of assistive devices plays an important role in determining the success of communication for individuals with impaired hearing in the educational, social, and employment spheres. Such assistance is mandated by Section 504 of the Rehabilitation Act of 1973, Public Law 94-142, and Public Law 98-199. The use of this guide will assist in carrying out the provisions of these laws to help meet the communication needs of individuals with impaired hearing.

PREVALENCE OF INDIVIDUALS WITH IMPAIRED HEARING IN MARYLAND

Hearing impairment has been judged to be the single most prevalent chronic disability in the United States (Healey et al., 1981). However, estimates of the prevalence and incidence of hearing impairment in the population are variable and highly dependent upon a number of factors. These factors include the definition of what constitutes significant hearing impairment as well as the procedures and research designs used to collect and analyze data.

A figure of 6.6 percent is often cited as the prevalence rate of individuals with significant hearing impairment in the total population of the United States. This figure reflects a combination of data from two independent projects conducted in 1971, which merged to form the National Census of the Deaf Population (NCDP). The first project focused on determining the size of the deaf population, or those individuals at the extreme end of the continuum of hearing impairment. The second project, the National Health Interview Study (NHIS), identified the size of the total population with impaired hearing irrespective of degree of hearing impairment. Significant hearing impairment was defined on the basis of individual reports of hearing status. The NHIS is an annual survey of households conducted by the National Center for Health Statistics and designed to identify health and sociodemographic characteristics of the population.

Application of the 6.6 percent figure to the 1981 estimated population of Maryland (Maryland Center for Health Statistics, 1984), the most recent year for which estimates are available, yields a prevalence figure of 280,856 individuals with a significant hearing impairment. However, prevalence varies markedly with age. NCDP estimates of the prevalence rate for hearing impairment among children under 17 years of age suggests a total of 20,875 in Maryland in 1981. While many of these children do not require and are not receiving special education services, most of these children would benefit from the use of assistive devices. The elderly represent the segment of the population with the highest prevalence of hearing impairment. Estimates vary from 17.4 percent to 28.4 percent for individuals 65 years of age and older. The more conservative figure, published by the NCDP, suggests the presence of 70,714 senior citizens with communicatively significant hearing impairments in the State of Maryland.

DESCRIPTION OF ASSISTIVE DEVICES

This document addresses six types of assistive devices for understanding verbal language: Induction Loop, FM Radio Frequency, Infrared, Telephone Aids, Hard Wire, and Captioning. The following material describes these devices and how they are utilized.

I. Induction Loop System

A coil of wire is placed around the area of a room. A wire lead running from the loop to an amplifier drives the loop. The amplifier receives input from one or more microphones, each with a separate volume control. Wireless microphones and an FM receiver may also be used. When needed, both the amplifier volume control and the volume control on individual hearing aids can be adjusted to give the optimal individual hearing volume. The amplifier plugs into any 120 volt current. This loop system can be portable or permanently installed.

The usual mode of reception is a hearing aid equipped with a telecoil (a magnetic induction coil). The hearing impaired person sits within the energy field radiated by the loop and switches on his or her hearing aid telecoil (from "M" to "T" or "MT"). Background noise is eliminated and the listener hears only what comes through the loop system. A special receiver is needed for persons who have no hearing aid or one without a telecoil. There is no loss in signal strength as the number of listeners increases. Signal strength (hearing) is excellent and consistent as long as the listener stays inside the loop, the system is correctly specified and installed, and the telecoil in the receiver is adequate.

II. FM Radio Frequency Systems

In 1982 the Federal Communications Commission (FCC) authorized the use of the 72MHz - 76 MHz FM band for general hearing assistance support. FM systems are divided into two classes, depending on the radio frequency band employed. The FCC regulations permit the use of eight wideband channels or 32 narrowband channels. If many simultaneous channels are needed, as in schools where many classrooms are involved, the narrowband channels are necessary. However, in an auditorium setting where only one channel (or possibly several for translation) is needed, the wideband channels can be used to great advantage. The wideband systems permit a greater dynamic range, resulting in a signal-to-noise ratio improvement of up to 9dB over the narrowband systems.

The speaker uses a microphone transmitter and the user a body-worn FM receiver. There are three modes of reception: a) A neck induction loop to function with the telecoil in hearing aids is plugged into the FM receiver. Sound information in the form of magnetic radiation from the loop is picked up by the telecoil of the hearing aid. b) No hearing aid is used and sound is delivered directly from the FM receiver which is connected to the ear via a cord and transducer. c) The FM receiver is connected by a cord to the amplifier of a hearing aid. Sound comes through the hearing aid.

Each listener adjusts his or her receiver to the desired volume. Since an FM signal goes through walls, you can receive the signal anywhere within transmission range with excellent sound fidelity.

III. Infrared System

Infrared technology uses invisible light beams to carry information from a transmitter to a personal receiver. The infrared spectrum falls in a region just below the visible light spectrum.

Infrared light is present in sunlight, incandescent light, and fluorescent light. Therefore, these sources of light are potential interference sources to an infrared communication system. Several technological principles will minimize the effects of these light sources: frequency modulation of the infrared light radiation plus amplitude modulation, and optical filtering at the receiver.

Because bright sunlight is an interference source that can disrupt the use of infrared transmission, the receiving diode must be kept out of direct sunlight. Infrared does not travel through walls, and it is absorbed by dark curtains, thus protecting the signal from competing with a second signal next door.

The sound sources goes into an infrared transmitter which sends the information through the air modulated on infrared light rays. The usual pick-up mode is a stethoscope type receiver headset with adjustable volume control. The receiver has an infrared sensitive receiving diode which decodes the infrared signal into an audio signal. A second reception mode for severely deaf persons looks like a body-style hearing aid.

IV. Telephone Aids

(a) TDD - Telecommunication Devices for Deaf People. These devices assist hearing-impaired persons to communicate over normal telephone lines with others who have the same equipment. Typewritten words are transmitted over telephone lines to persons anywhere in the world via the TDD and appear in a visual readout on a screen, or as a "hard copy" printout on paper. TTY is another acronym for TDD.

(b) Telephone Amplifier - An amplifier either in the handset or attached to it, containing a volume control which permits the adjusting of volume according to need. They can be used with or without a hearing aid. There are several kinds:

- an adjustable volume control is built into the telephone receiver
- a portable telephone amplifier, which is battery-operated and which has an adjustable volume control, is slipped over the telephone receiver. It is convenient to carry in pocket or purse.
- an amplifier with volume control is attached to the phone, and the handset is plugged into it.
- a box-shaped conference-call type of device through which sound is amplified.

(c) Telecoil - Commonly known as the "t" switch on a hearing aid. The telecoil is an induction coil which takes sound from electromagnetic signals and feeds it into the amplifier circuitry of the hearing aid. A telecoil makes it possible for many hearing aid users to communicate by telephone if the telephone itself has a telecoil. Background noises are minimized when the hearing aid is set in the "t" position. The telecoil, besides providing an effective means of communicating by telephone, makes possible the use of induction loops and other assistive listening devices when the hearing aid is set on the "t" switch position.

V. Hardwire

An actual wire connects the device worn by the user to the sound source located near the person speaking. A hardwire device could be used in situations involving a few other people, such as in small group discussions, workshops, and social gatherings, or in noisy environments such as automobiles, cafeterias, and out-of-doors. Composed of a small microphone, amplifier, and receiver, these systems convey the amplified speech signal directly from the microphone to the listener's ear. Other sounds are thus reduced in comparison to the speech signal. Hardwire personal assistive systems are excellent when the wire connection poses no problems.

VI. Captioning

(a) Closed Captioning - Telecaption adapters or decoders are built into or attached to television sets and enable their owners to read captions which are printed on the television screen. This kind of captioning is pre-edited and is used in films and pre-recorded TV programs of all types.

(b) Real-time Captioning - The program is captioned as human speech is being spoken. This is carried out by a highly-trained stenographer who enters phonetic symbols into a computer containing an extensive dictionary. The computer then translates the phonetic symbols into captions which reach the viewer approximately four seconds after the word was spoken. This type of captioning is more exposed to inaccuracies and errors because of the rapidity with which it is done and because the computer can only translate words which are already in its memory. Therefore some words may "mistranslate." New words are constantly being put into the computer's memory, and as the dictionary grows, these errors will become less frequent. Real-time captioning is used for news programs, sports events, and special events.

GUIDELINES FOR THE LOCATION OF ASSISTIVE DEVICES

The following guidelines will provide information concerning the location of assistive devices for their most effective utilization. In general, the guidelines recommend portable devices for all but large assembly rooms. While other rooms in a facility may change functions as the student population fluctuates and programs evolve and modify, the large assembly room will most probably remain constant during the life of a building. Portable assistive devices generally will provide more flexibility and cost effectiveness in responding to changing conditions over time.

Large Group Setting

1. An assistive communication system should be provided for the primary assembly area of each school and administrative complex. While the appropriate location will vary from school to school, the auditorium, cafetorium, or multi-purpose room would usually be designated.
2. In a central administrative complex, the Board of Education meeting room would be appropriate. In a regional administrative complex, the appropriate location may be the largest and most frequently used conference space.
3. These devices can be installed permanently or be portable units.

Small/Medium Group Setting

1. Portable assistive devices should be available as needed for hearing impaired individuals using conference rooms, the media center, and instructional rooms of all types.
2. In particular, portable devices should be available as required to support the activities of the speech-language pathologist, audiologist, teacher of the hearing impaired, reading specialist, occupational therapist, physical therapist, and adaptive physical education teacher.

One-to-One Setting

1. Portable assistive devices should be available upon need to hearing impaired individuals involved in one-to-one instructional settings.
2. All telephones should be compatible with hearing aids.
3. All public telephones should be equipped with an amplified handset and a volume control. A minimum of one telephone in the administrative office of a school or Board of Education administration building should be equipped with an amplified handset with all other telephones equipped as required by staff or students.

4. TDDs should be provided in at least the following central administrative locations of a school system: (a) public information office, (b) special education office, and (c) regional administrative offices. TDDs should be provided in school facilities as their use becomes required.

Media

1. At least one portable television decoder should be available in each school building and the central administrative locations of a school system.

INFORMATION TO AID IN THE SELECTION OF ASSISTIVE DEVICES

	INDUCTION LOOP	FM RADIO FREQUENCY	INFRARED	HARDWIRE	CLOSED CAPTIONING	REAL-TIME CAPTIONING
BASIC DESCRIPTION	Sound is transmitted via a mike and amplifier or through standard PA system via a length (loop) of wire placed within or around the seating area. The electrical current flowing through the loop creates a magnetic field that can be picked up by a hearing aid equipped with a "t" (telecoil) switch. Portable receivers are available for individuals without a hearing aid "t" switch.	Sound is conducted from wireless FM transmitter(s) directly to listener's wireless receiver(s). Transmission of signal is frequency specific and broadcasting channels must be compatible.	Harmless infrared rays transmit the sound to listeners from a transmitter which may be plugged into the existing PA system. Users wear portable, battery operated receivers which may have earphones attached to a plastic housing or be modified for use with a hearing aid.	1. Sound is transmitted via amplifier by means of wires through junction boxes with the user plugging a headset into junction box. 2. May have a personal device with a microphone on a long cord used by a speaker.	Closed captioning is a process by which a special decoding device translates the audio portion of a television program into captions (subtitles) which appear on the screen. Hearing-impaired viewers can read what they cannot hear. Closed captions can only be seen if a television set is equipped with the special decoding device.	Real-time captions are written on the same kind of stenotype machine used by court reporters. The system can capture and subtitle human speech as it is spoken. It requires an operator to enter information using shorthand. The stenotype machine connects to a computer system which translates the shorthand into regular English words, and formats these words into captions. The display may be translated into hard copy using a printer.
EQUIPMENT IN SYSTEM	Solid state power amplifier. One or more microphones (may be wireless). Induction loop (wire) in lengths appropriate for coverage area. Used with portable receivers or hearing aids with telecoil.	Wireless transmitters, wireless receivers. Cords and transducers coupled to personal earmolds or headphones, or neckloop with hearing aid, or direct audio input cords with hearing aid. Battery charger storage case.	Infrared light transmitter sends signals through the air which are picked up by an infrared receiver worn by the listener. The receiver may be used with earphones, induction loops or hearing aids with special modification.	Microphone. Amplifier. Conduit or other protected wiring. Junction Boxes. Desks or seats which will allow installation of junction boxes.	A special decoder either built into a television set or purchased separately and attached to the television is required to see the captions.	Equipment consists of a portable stenotype machine used by a trained stenotypist, a computer with a display screen and printer, and a software program.
RELATIONSHIP TO CURRENT PUBLIC ADDRESS SYSTEM	Can use currently installed PA system. Without a PA, an amplifier and microphone are needed. Two or more microphones are good in group interactive situations. With two or more microphones they should feed into mixer prior to amplification.	Direct input to the FM transmitter from the PA system is possible for general broadcasting.	Can use currently installed PA system. For rooms with a PA, the emitter can be purchased with a built-in amplifier.	Can be installed with connection to existing PA system.	Not applicable	Not applicable
DESCRIPTION OF RECEIVER	Users own hearing aid if equipped with telecoil. Portable receivers are available such as a hand held (wireless) or miniature battery operated receivers.	Small pocket-sized unit (similar to portable radio) which can be worn clipped to a belt, in a pocket, or in a harness.	Plastic case is worn under the chin. The case may be attached to stethoscope earphones or audio neck loop.	Listening via headset or personal amplifier can input to hearing aid via teleloop.	Not applicable	Not applicable
SIGNAL STRENGTH	Amplifier has volume control. Hearing aid wearers can adjust volume on hearing aid. Portable receivers are also adjustable. Volume will depend on strength of the telecoil, spatial orientation of telecoil to loop, and strength of loop. Those nearest the loop receive more volume.	For all degrees of hearing loss. Coverage: entire classroom, auditoriums, theaters, etc.	Receiver has volume control.	Junction box has user adjustable volume control. With a personal system user adjusts volume on hearing aid.	The size of the captions varies with the television screen. For example, on a 19" television screen captions are approximately 1/2" high. The captions are easily visible because the area immediately behind them is blacked out.	Not applicable

INSTALLATION REQUIREMENTS	Amplifier plugs into ordinary grounded electrical outlet. Best installation keeps wire loop out of the traffic flow. Pre-packaged system does not need a professional installer.	Varies by type. Many require minimal installation. Those with mounted antennas require additional work and time.	Large assembly rooms require one or more permanently mounted transmitters. An audio line from amplifier serves as signal input for transmitter. For television, radio or tape recording an amplifier/transmitter is used with microphone or patch cord.	Amplifier plugs into ordinary grounded electrical outlet. Best installation is permanent, with protected wiring kept out of the traffic flow. Personal system requires no installation.	All decoders connect to regular television sets with jacks that are purchased with the decoders. They are compatible with all television sets, cable TV and videocassette recorders.	None, except purchase of suitable equipment.
UPKEEP/CARE	Beyond periodic monitoring, the system requires little or no maintenance. Optional portable receivers would need to be distributed, collected, cleaned and re-charged after use.	Routine maintenance and daily monitoring by trained personnel. Batteries for transmitters and receivers are rechargeable. Schools will need a maintenance contract to maintain equipment in good functioning condition.	Transmitter needs little or no maintenance. Receiver headset would need to be distributed, collected and cleaned after each use. Batteries for receivers are rechargeable.	Needs little or no maintenance. Headset needs to be distributed, collected, cleaned after each use.	All vendors provide a warranty varying from 30 days to one year and service contracts are available.	Warranty and service contracts are available from vendors. No special electrical or air conditioning requirements are necessary.
COST	Cost will vary with the size of the area to be covered but generally range between \$350 up to \$3000 (includes amplifier, microphone and loop). Portable receivers cost about \$75.	Varies. Total cost will depend on components purchased. Approximate range: Receivers \$250 - 700 Transmitters \$350 - 900 Chargers \$25 - 500 Other accessories vary.	Transmitter: Range \$150-\$750. Receivers: about \$120 each. Wall mounts/accessories additional when required. Multiple transmitters may be required for large installations.	Single unit (including headphone and cord): \$400-\$700 Group System Amplifier : \$900 Microphones: \$30-\$125 Junction Box: \$85-\$150 each including headphone and wiring	At present all decoders sell for approximately \$250-\$300. Televisions with built-in decoding vary in price depending on the unit.	\$25,000 to \$50,000 depending on computer selected. Also, the stenotypist must be paid. This system is cost prohibitive in public school systems, but has been included as information understanding that this recent technology is quickly evolving.
PORTABILITY	Systems may be portable. Large installations should be permanently installed.	Maximum flexibility and portability.	Not portable for large installations. Television, radio and tape recorder systems are portable.	Only personal devices are portable.	All decoders are portable, light weight, and compact, making it easy to transport from one place to another.	Is possible but not practical.
SUITABILITY FOR OUTDOORS	Yes, but users must stay within the loop. Mike would need windscreen.	Excellent	Usually not practical because the system cannot be used in direct sunlight.	Not suitable for outdoors, with the exception of a personal device.	May be used outdoors with television sets that are used in that way.	Not suitable.
TARGET POPULATION	For individuals with all degrees of hearing loss.	For all degrees of loss, and especially suitable for individuals with losses moderate to profound in degree.	Suitable for mild and moderate losses with standard receivers. May be used by people with greater losses when used with hearing aid.	Effective for most degrees of hearing loss.	Anyone.	Anyone.
MAJOR ADVANTAGES	Relatively inexpensive and easy to install. No special receivers needed by people whose hearing aids are equipped with adequate telecoils.	Excellent sound quality. Portability. Choice of broadcasting channels. Can be used with or without hearing aids. Can be used as an individual or group system.	Good sound quality. Comfortable for user to wear and easy to operate.	Relatively inexpensive. Relatively trouble free. Users do not need hearing aids. Can deliver good sound quality and high level of amplification.	Closed captioning makes television viewing possible for hearing impaired people who would otherwise not be able to enjoy it. The advantages are directly related to the number of programs that are captioned. Any program can be captioned and the number of such programs is increasing rapidly.	Translates and displays the spoken word as it is spoken, and provides hard copy as desired.
MAJOR DIS-ADVANTAGES	Users need hearing aids with adequate telecoils unless portable receivers are purchased. May pick up interference from fluorescent lighting or from adjacent looped areas. Sound quality not always uniform throughout looped area due to layout pattern, strength of loop, and/or strengths of individual telecoils.	Multiple parts and controls and complex interactive effects.	Useful only for mild to moderate hearing losses unless optional audio loop receivers are purchased for use with t-switch hearing aids. Large amounts of direct light in a room may produce interference. Equipment must be cleaned and batteries charged.	Restricts users to specific seats. Personal systems require wired connection between speaker and listener.	The presence of captions may be distracting, which is why they are visible only to people using decoders. Sometimes the captions are not synchronized with lip movements of speakers on the television screen. Not all programs are captioned.	1. There are inaccuracies in the display. There is a need for specially trained operators and for constant updating of computer memory. There is a delay of several seconds between the spoken word and captioning. High Cost.

INFORMATION TO AID IN THE SELECTION OF ASSISTIVE DEVICES

		BASIC DESCRIPTION	APPLICATION	COST
TDD		Most TDD's are designed to transmit a typed message over the telephone from one machine to another. The message appears on a typewritten page, a screen display (LED), or both. This type of TDD can be portable or non-portable. Both parties must have a device. Other types of TDD's include systems which use a touch-tone code to transmit the message. They are portable and incorporate a visual display (LED). One device is needed by a hearing impaired person who uses voice to transmit the message. Both parties must know the touch-tone code.	Visual display (typewritten page or LED) of message transmitted over the telephone. These devices are for individuals who cannot use voice amplification systems for telephone communication.	Prices vary. Approximate range is \$150-\$900.
TELEPHONE AMPLIFIERS	SPEAKER PHONE	This is a speaker with an amplifier which is coupled to the telephone to provide an amplified sound field signal. Installation is required.	Voice amplification for telephone communication. Can be used with or without a hearing aid.	Prices vary.
	MODULAR AMPLIFIER	This device plugs into modular telephones and can amplify the signal by as much as 17 dB. It requires no batteries or special installation. It is equipped with a numbered volume control.	Voice amplification for telephone communication. Can be used with or without a hearing aid.	Prices vary. Approximate range is \$20-\$50.
	PORTABLE EARPIECE	This is an easily portable amplifier which can be slipped over the telephone handset to amplify the signal. Some devices have a built-in volume control. These devices are battery powered and can amplify the signal as much as 12 dB.	Voice amplification for telephone communication. Can be used with or without a hearing aid. This device may be difficult to use with certain unusual handsets.	Prices vary. Approximate range is \$40-\$150
	TELEPHONE HANDSET	This is a telephone handset with a built-in volume control. It increases the signal by as much as 25 dB.	Voice amplification for telephone communication. Can be used with or without a hearing aid.	Can be purchased from telephone companies or from special needs centers. Prices vary.
HEARING AID TELECOIL		A telecoil is a magnetic induction coil which is built into a hearing aid and activated by a switch. It is designed to pick up a signal transmitted in a magnetic field. The hearing aid volume control adjusts the intensity of the signal.	The primary function of a hearing aid telecoil is to pick up a signal transmitted over a compatible telephone. Magnetic telephones are compatible. Compatible public telephones are identified by a blue grommet located where the cord enters the handset. The telecoil can also be used to couple the hearing aid to an FM system. A neck-worn induction loop connected to the FM receiver is used to create the magnetic field. In areas equipped with an induction loop system the hearing aid telecoil may be activated to receive the signal.	There is usually no separate charge for a telecoil. It is a standard feature on many hearing aids.

REFERENCE LIST OF INSTALLATIONS IN THE MARYLAND AREA

<u>Facility Name and Address</u>	<u>Contact and Phone #</u>	<u>Building Type</u>	<u>Device</u>	<u>Location</u>
American Speech-Language Hearing Association Johnson Education Center Rockville, MD 20852	Ron Wexler 301-897-5700	Office	FM System	Meeting Room
Arena Stage 6th & M Streets, S.W. Washington, D.C. 20024	Wayne White 202-554-9066	Theater	FM System	In 2 Theaters
Ascension Evangelical Lutheran Church 7601 York Road Baltimore, MD 21204	George Mocko 301-825-1725	Church	Induction Loop	Meeting Rooms
Baird Auditorium National Museum of National History Constitution Avenue at 10th Street, N.W. Washington, D.C. 20560	Janet Majewskie 202-357-1300	Auditorium	Induction Loop Presently Testing individual loop device	Auditorium
Baltimore County Public Library 1301 Reisterstown Road Pikesville, MD 21208	Francis Old 301-484-2131	Library	Induction Loop	Meeting Rooms
Baltimore County Public Library 320 York Road Towson, MD 21208	Walt Opher 301-296-8500	Library	Induction Loop	Meeting Rooms
Baltimore County Public Library 9833 Greenside Drive Cockeysville, MD 21030	Helen Carter 301-666-0447	Library	Induction Loop	Meeting Rooms
Baltimore Hebrew Congregation 7401 Park Heights Avenue Baltimore, MD 21208	Mr. Schreiber	Synagogue	Induction	Sanctuary
Beth AM Synagogue 2501 Eutaw Place Baltimore, MD 21217	Debbie Potts 301-523-2446	Synagogue	Induction Loop	Sanctuary
Beth El Congregation 8101 Park Heights Avenue Baltimore, MD 21208	Rose Pollack 301-484-1448	Synagogue	Induction	Sanctuary

<u>Facility Name and Address</u>	<u>Contact and Phone #</u>	<u>Building Type</u>	<u>Device</u>	<u>Location</u>
Bethesda Public Library 7400 Arlington Road Bethesda, MD 20814	Wash. Area Group for the Hard of Hearing 301-986-8450	Library	Induction Loop	Main Conference Room
Bethesda United Methodist Church 8300 Old Georgetown Road Bethesda, MD 20814	John Lehman 301-652-2990	Church	FM Systems	Sanctuary
Beth Tfiloh Synagogue 3300 Old Court Road Baltimore, MD 21208	Rita Warshawsky 301-486-1900	Synagogue	Induction Loop	Sanctuary/ Sangner Auditorium
Brown Memorial Woodbrook Presbyterian Church 6200 N. Charles Street Baltimore, MD 21212	Dr. Lyle Dykstra 301-377-7232	Church	Induction Loop	Sanctuary
Cedar Lane Unitarian Church 9601 Cedar Lane Bethesda, MD 20814	Capt. A. Skinner 301-493-8300	Church	Induction Loop	Sanctuary
Center Stage 700 N. Charles Street Baltimore, MD 21202	Cathy Loehmer 301-685-3200	Theater	Infrared	Theater
Chizuk Amuno Congregation 8100 Stevenson Road Baltimore, MD 21208	Stanley Minch 301-486-6400	Synagogue	Induction Loop	Sanctuary
Church of the Redeemer 5603 N. Charles Street Baltimore, MD 21210	Nancy Spiva 301-435-7333	Church	Induction Loop	Sanctuary
Concord St. Andrew United Methodist Church 5910 Goldsboro Road Bethesda, MD 20817	Board of Directors 301-229-3383	Church Persona- phone 2 installed	Telex	Sanctuary
Congregation Har Tzeon- Aguc Achim 1840 University Blvd. W Silver Spring, MD 20902	Mark Kronisch 301-649-3800	Synagogue	Induction Loop	Sanctuary
Enoch Pratt Free Library 400 Cathedral Street Baltimore, MD 21201	Marcia Eisenstein 301-396-5430	Library	Induction Loop; TDD	Wheeler Auditorium (IL); Central Hall (TDD)

<u>Facility Name and Address</u>	<u>Contact and Phone 3</u>	<u>Building Type</u>	<u>Device</u>	<u>Location</u>
Essex Community College 7201 Rossville Boulevard Essex, MD 21237	Kathy McSweeney 301-522-1641	Classroom/ Office	Induction Loop; TDD	Humanities & Arts Bldg. (IL); as needed (TDD)
First and Franklin Street Presbyterian Church 210 W. Madison Street Baltimore, MD 21210	David Wallace 301-728-5545	Church	Induction Loop	Sanctuary
First Baptist Church of Rockville 55 Adclare Road Rockville, MD 20850	Jerold Williams 301-279-2400	Church	Pocket- type transistor radio attach. for ears	Sanctuary
First Baptist Church of Wheaton 10914 Georgia Avenue Silver Spring, MD 20902	Church Trustees 301-949-6585	Church	Induction Loop	Sanctuary
Gallaudet College 7th Street & Florida Avenue, N.E. Washington, D.C. 20002	Dr. Harriet Kaplan 202-651-5328	Auditoriums Classrooms Demonstra- tions Center	Induction Loops TDDS FM System Amplified Tele. Handsets Infrared Hardwire Closed Caption	Induction Loop: Field House Ely Auditorium Elsted Auditorium Kendal Auditorium Classrooms FM, Infrared, Hardwire: Mary Thornberry Building Captioning, TDDS, Amplified Tele- phones: Through- out Campus
Har Sinai Congregation 6300 Park Heights Avenue Baltimore, MD 21215	Mr. Goldman 301-764-2882	Synagogue	Induction Loop	Sanctuary
Hearing and Speech Agency of Metropolitan Baltimore 2220 St. Paul Street Baltimore, MD 21218	Jean Chaplan 301-243-3800	Office, Meeting, clinic, school	Induction Loop; TDDs	Resource Room and other rooms as needed (IL); offices (TDDs)
Holiday Park Multiservice Senior Center 3950 Ferrara Drive Wheaton, MD 20906	Judy Giefand 301-468-4448	Community Center	Induction Loop	Multi-purpose Room

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Hope Presbyterian Church 4748 Shelbourne Road Baltimore, MD 21227	Bob Tyson 301-247-4673	Church	Induction Loop	Sanctuary/ Fellowship Room
Jewish Community Center 6125 Montrose Road Rockville, MD 20852	Sarah Milner 301-881-0100	Community Center	TDD Induction Loop	Kreeger Auditorium
Joseph Myerhoff Symphony Hall 1212 Cathedral Street Baltimore, MD 21210	Mark Grabowski 301-727-8810	Symphony Hall	Induction Loop	Orchestra Level only
Kennedy Center for the Performing Arts Washington, D.C. 20566	Dick Owens 202-872-0466	Concert Hall Opera House Eisenhower Theater	Infrared	Concert Hall, Opera House, Eisenhower Theater
Keswick Home 700 West 40th Baltimore, DM 21211	Mary Hedeman 301-235-8860	Nursing Home	Induction Loop	Auditorium
Lovely Lane United Methodist Church 2220 St. Paul Street Baltimore, MD 21218	Mr. D. Watchorn 301-889-1512	Church	Induction Loop	Sanctuary
Maryland Rehabilitation Center 2301 Argonne Drive Baltimore, MD 21218	Esther Miller 301-366-8800	Rehabili- tation Center	Induction Loop; TDD	Auditorium (IL); Counsel- ing & Evaluation Depts. (TDD)
Maryland State Department of Education 200 West Baltimore Street Baltimore, MD 21201	Skip Sanders 301-659-2000	Office	Induction Loop	Board Room
Montgomery County Circuit Court 50 Courthouse Square Rockville, MD 20850	Ed Schafer 301-251-7073	Public Building	Induction Loop	Court Rooms
Montgomery County Government County Council Hearing Room County Office Building 100 Maryland Avenue Rockville, MD 20850	Ed Shafer 301-279-1819	Public Building	Induction Loop	County Council Hearing Room

<u>Facility Name and Address</u>	<u>Contact and Phone #</u>	<u>Building Type</u>	<u>Device</u>	<u>Location</u>
Montgomery County Executive Office Building Auditorium	Ed Shafer 301-279-1900	Public Building	Induction Loop	Auditorium
Montgomery County Public Schools Auditory Services Programs 390 Martins Lane Rockville, MD 20850	Sheila Doctors 301-460-9289	Office	FM System; Induction Loop; TDDs Amplified Telephone Handsets	In Schools throughout the county
Montgomery County Public Schools Board of Education 850 Hungerford Drive Rockville, MD 20850	Bill Melton 301-279-3102	Office	Induction Loop	Board Room
Morris Mechanic Theater Hopkins Plaza Baltimore, MD 21201	Mr. Kidwell 301-6254230	Theater	Infrared	Theater
National Theater 1321 E. Street, N.W. Washington, D.C. 20004	Paula Monihan 202-628-6161	Theater	Infrared	Theater
Peabody Institute 1 E. Mt. Vernon Place Baltimore, MD 21202	Anne Garside 301-659-8163	Conser- vatory Building	Infrared	Peabody Concert Hall
Prince George's County Public Schools - Audiology Services 1200 Richie Road Capitol Heights, MD 20743	Frankie Michelson 301-336-7615	Office	FM System; TDDs; Amp- lified Telephone Handsets	In schools throughout the county
Prince George's County Government Administration Building Room 1126 Upper Marlboro, MD 20772	Terezie Bohrer 301-627-3352	Office	TDD	Central Office
Prince George's County Police Communications Capitol Heights, MD 20743	Police Officer 301-350-1181	Police and Fire Emergencies	TDD	Central Communications Office

<u>Facility Name and Address</u>	<u>Contact and Phone #</u>	<u>Building Type</u>	<u>Device</u>	<u>Location</u>
Prince George's County Public Schools Public Affairs and Communications Administrative Services Center Upper Marlboro, MD 20772	Brian Porter 301-952-3058	Office Office	TDD TDD	Office of Public Affairs and Communi- cations
St. Bartholomews Church River Road Bethesda, MD 20814	Minister 301-229-7933	Church	Induction Loop	Sanctuary
St. Elizabeth Church 2700 E. Baltimore Street Baltimore, MD 21224	John Dietzenbach 301-675-8260	Church	Induction Loop	Sanctuary
St. Gregory the Great Roman Catholic Church 1542 North Gilmore Street Baltimore, MD 21217	Mai Thomas 301-523-0061	Church	Induction Loop	Sanctuary
St. Jane de Chantal Catholic Church 9525 Old Georgetown Road Bethesda, MD 20814	Mon. Christopher 301-530-1550	Church	Induction Loop	Sanctuary
St. Matthews United Methodist Church 14900 Annapolis Road Bowie, MD 20715	Mens Club 301-262-1408	Church	Induction Loop	Sanctuary
St. Michael Lutheran Church 9554 Belair Road Baltimore, MD 21224	Donald McKinstry 301-256-6441	Church	Induction Loop	Sanctuary
St. Pius X Roman Catholic Church 6428 York Road Baltimore, MD 21212	Sister Sharon 301-377-6828	Church	Induction Loop	Sanctuary
St. Stephen Lutheran Church 901 Courtney Road Baltimore, MD 21227	Russell Gilbert 301-242-0422	Church	Induction Loop	Sanctuary
School for the Deaf 101 Clarke Place P.O. Box 350 Frederick, MD 21701	Chad Baker 301-662-4159	School	FM ampli- fiers. Amplified Telephone Handset TDDs	School

<u>Facility Name and Address</u>	<u>Contact and Phone #</u>	<u>Building Type</u>	<u>Device</u>	<u>Location</u>
Self Help for Hard of Hearing People, Inc. (SHHH) 7800 Wisconsin Avenue Suite 100 Bethesda, MD 20814	Howard Stone 301-657-2248	Dem. Center	Induction Loop: FM System for hearing aids; TDD; Television with decoder; Infrared	Demon. Area
Seventh Day Adventist Church 8900 Colesville Road Silver Spring, MD 20902	Robert Randall 301-589-5768	Church	Induction Loop	Sanctuary
Social Security Administration 6401 Security Boulevard Baltimore, MD 21235	Gabriel Digiacomo 301-594-3567	3 Office Buildings	Induction Loop	Conference Rooms
Temple Oheb Shalom 7310 Park Heights Avenue Baltimore, MD 21208	Jesse Harris 301-358-0105	Synagogue	Induction Loop	Sanctuary
The Round House Theater 12210 Bushey Drive Silver Spring, MD 20560	Lynda Yost 301-468-4172	Theater	Infrared	Theater
The Senator 5904 York Road Baltimore, MD 21201	William Hewitt 301-435-1118	Movie Theater	Induction Loop	All Seats
Towson State University York Road Towson, MD 21204	Dr. Vic Gladstone Margaret Warrington 321-2449; 321-2638	Classroom; Office	Induction Loop; TDDs	Van Bokkelen Auditorium; TDDs-as needed
Veterans Administration Medical Center 566-126 Fort Howard, MD 21052	Dr. Henry Tobin 301-477-1800	Hospital	Induction Loop	Theater, Admissions area

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